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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/535,696 | 03/27/2000 | Scott Arthur Jones | 10001011-1 | 4175 |
| 22879 | 7590 | 03/12/2004 | EXAMINER | |
| HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400 | | | -- PHAN, MAN U | |
| ART UNIT | | PAPER NUMBER | | 10 |
| 2665 | | | | |

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|------------------------------|------------------------|---------------------|
| | 09/535,696 | JONES ET AL. |
| Examiner | Art Unit | |
| Man Phan | 2665 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 24 November 2003.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-18 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) Notice of Informal Patent Application (PTO-152)
6) Other: _____

OFFICE ACTION

1. This communication is in response to applicant's 11/24/2003 Amendment in the application of Jones et al. for a "Method and system for transmitting data between a receiver and a transmitter" filed 03/27/2000. This application is a Request for Continued Examination (RCE) under 37 C.F.R. 1.114 filed on December 09, 2003. The amendment to the claims filed 11/24/2003 has been entered and made of record. Applicant's arguments to the pending claims have been considered but are not persuasive, and will be examined as discussed below. Claims 1-18 are pending in the application.

Claim Rejections - 35 USC '103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were

made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-3, 5-8 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Num et al. (US#5,633,867) in view of Sugawara (US#5,852,602).

With respect to claims 1, both Ben-Num and Sugawara disclose a method and system for permissible transmission in virtual channel credit packet according to the essential features of the claims. Ben-Num et al. (US#5,633,867) discloses in Fig. 4 a block diagrams of an exemplary credit-based ATM flow control mechanism, in which a receiver (112) sending to the transmitter (100) a Virtual Channel credit packet (128) indicating that the receiver (112) is available to receive data. The transmitter (100) and receiver (112) are in communication via a plurality of Virtual Channels (106, 114), each being assigned with a unique VC number. The transmitter responding to the virtual channel credit packet including transmitting a data packet on the assigned unique VC to the receiver if a data packet is available (Col. 5, lines 7 plus and Col. 2, lines 21 plus). Though Ben-Num does not explicitly show the receiver receiving the “another cell” transmitted from the transmitter, the receiver receiving the data implies it receives (Col. 5, lines 27-28). It has become common to utilize the flow-control mechanisms to reduce congestion in the packet communications network. Such mechanism pre-allocate receiver (receiver side) buffer credits to packet source and notify the corresponding

sender (transmitter side) as to how much data can be sent. In the same field of endeavor, Sugawara (US#5,852,602) discloses a method and system for controlling credit packet in an ATM communication apparatus which transfers data by flow control using credit information. Sugawara teaches in Figs. 4A&B the flow charts illustrated the operation of a credit control method and system, an initial credit value is sent from a receiving-side to a sending-side prior to transferring a packet. Transfer of a packet is started on the sending-side when this credit value is received. On the receiving-side, a new credit value is calculated when the packet is received, and the same number of packets as the number indicated by the calculated new credit value are received and processed. A new credit value is sent to the sending-side whenever receiving buffers whose number equals the preceding new credit value are emptied. On the sending-side, the sum of the new credit value and the initial credit value, whenever the new credit value is received, is stored as a credit value indicating the number of successively transmittable packets (Col. 2, lines 46 plus; Col. 11, lines 49 plus)

Regarding claim 2, Ben-Num teaches that the virtual channel credit packet is sent when the receiver has the available resources (*cell will have buffer*) to receive transmission data from the transmitter and is ready to do so (*okay to send*) (Col. 5, lines 8-9).

Regarding claim 3, Ben-Num teaches that the data includes the unique virtual channel number (68, 70) assigned to the particular virtual channel (See Fig. 3; Col. 5, lines 47-49).

Regarding claim 5, Ben-Num teaches of carrying a “credit”, indicating the availability of a buffer in the receiver for a virtual channel (Col. 5, lines 7-10). The credit

is stored by “credit return mechanism” that is a FIFO buffer used to store credits to be returned the transmitter, for particular virtual channels (Col. 9, line 48 - Col. 10, line 4).

Though Ben-Num does not explicitly show the receiver checking for available buffer for transmission. It is inherent that the receiver does this in order to produce credits to be placed in the “credit return mechanism”. Ben-Num further teaches of not returning a credit for a cell received by the receiver and placing it into the stalled queue, where there is a stored variable for recording the number of credits not returned. These credits are then placed in the “credit return mechanism” when they are moved to the active queue (Col. 7, lines 50-63 and Col. 9, lines 59-64), i.e. when the buffer is available , which will then send the virtual channel credit packet for the particular virtual channel once buffer is available (Col. 9, lines 65-66 and Col. 5, lines 53-58). Therefore, when the buffer is not available (stalled queue), the receiver waits a predetermined time, which is the time until the VC is moved to the active queue.

Regarding claim 6, It's inherent in the design that the receiver repeating the step of checking for available buffer until a buffer is available because the system disclosed by Ben-Num returns the credits to the transmitter after they have been moved to the active queue (Col. 7, lines 61-63 and Col. 9, lines 59-61). Therefore, a process of checking for this event must occur and be repeated so that credits can be returned. With respect to claim 16, Ben-Num discloses in Fig. 4 a block diagrams of an exemplary credit-based ATM flow control mechanism according to the essential features of the claims, in which a receiver (112) sending to the transmitter (100) a Virtual Channel credit packet (128) indicating that the receiver (112) is available to receive data. The transmitter (100) and receiver (112) are in communication via a plurality of Virtual

Channels (106, 114), each being assigned with a unique VC number. Ben-Num further teaches of a means for sending a virtual channel credit packet (128) for a particular channel to the transmitter (100) (Col. 5, lines 11-23 and 46-50). Ben-Num further teaches that the credit packet being indicative that the receiver is available to receive data (Col. 5, lines 7-10); means for responding to the virtual credit packet and transmitting a data packet to the credit packet sending means (another cell of VCI 106) (Col. 5, lines 27-28); means for accepting (118) the data packet from the data packet transmitting means (102); the virtual channel credit packet (ATM cell 128) (Fig. 4; Col. 5, lines 24-28) having a unique virtual channel number (68, 70) assigned to the particular virtual channel (See Fig. 3; Col. 5, line 47-49).

Regarding claim 17, Ben-Num discloses in Fig. 4 a block diagrams of an exemplary credit-based ATM flow control mechanism according to the essential features of the claims, in which a receiver (112) sending to the transmitter (100) a Virtual Channel credit packet (128) indicating that the receiver (112) is available to receive data. The transmitter (100) and receiver (112) are in communication via a plurality of Virtual Channels (106, 114), each being assigned with a unique VC number (Col 5, lines 11-23 and 46-50). Ben-Num further teaches that the credit packet being indicative that the receiver is available to receive data (Col. 5, lines 7-10); a transmitter being adapted to respond to the virtual channel credit packet and transmit a data packet to the receiver (another cell) (Col. 5, lines 27-28); a receiver being adapted to accept the data packet transmitted from the transmitter; the virtual channel credit packet (ATM cell 128) (Fig. 4; Col. 5, lines 24-28) having a unique virtual channel; number assigned to the particular virtual channel (See Fig. 3; Col. 5, line 47-49).

Regarding claim 18, Ben-Num teaches that the virtual channel credit packet is further indicative of the receiver having an available buffer of sufficient capacity (*cell will have a buffer*) to receive a data packet from the transmitter (*okay to send*) (Col. 5, lines 8-9).

With respect to claims 7, Ben-Num and Sugawara disclose the claimed limitations with the rejection of claim 1 as discussed in paragraph 4 above. Sugawara teaches of a transmitter checking for an available buffer, waiting a predetermined time if unavailable, and looking for a virtual channel credit packet from the receiver if a buffer is available (Col. 2, lines 46 plus). Ben-Num further teaches in Fig. 4 an exemplary credit-based ATM flow control mechanism, includes a transmitter portion of a communications link (102) (Col. 5, lines 2-4), and further teaches of the system designed such that there are “credits and buffers per VC” (Col. 4, lines 66-67), therefore there are buffers in the transmitter (102) assigned to a specific VC. Incoming data to a transmit buffer that is occupied would cause data collision if it were to enter before finishing with the previous data, resulting in corruption of data. Prematurely emptying the transmit buffer of its current data to allow incoming data is undesirable as it is what the system discloses by Ben-Num seeks to avoid through transmitting only when given permission through credits (Col. 2; lines 21-34). Therefore, it would have been obvious to check upon the availability of a transmitter buffer, of data incoming on a specific VC before accepting it into the buffer. Additionally, the process carried out by a transmitter, such as cell transmission and SAR (Col. 3, lines 40-45) require a specific amount of time to be carried out, therefore an unavailable transmit buffers state would only change after a period of time that would allow these processes to be carried out and the transmit buffer

to free up space. It would have been obvious for the transmitter (102) to wait a predetermined time (sufficient for the processes to complete and free space in the buffer before checking again), if the buffer were found unavailable.

Finally, Ben-Num teaches of the transmitter transmitting only when it has a credit on a particular virtual channel, which it receives from the receiver (Col. 5, lines 14-18, 21-23 and 27-28). It would have been obvious for a transmitter with a buffer available to transmit data to look for the receipt of a credit packet, so that the transmit data can be transmitted when detected.

One of ordinary skill in the art would have been motivated to check for available buffers, wait for a predetermined time when unavailable and check for credits when available for a specific VC, so that the transmit buffer can handle incoming data more efficiently and prevent data loss due to buffer congestion while waiting for transmit credits.

Regarding claim 8, Ben-Num and Sugawara disclose the claimed limitations with the rejection of claim 4 as discussed above. Ben-Num et al. fails to explicitly teach of the transmitter waiting further comprising repeating the steps of checking for available buffer. As discussed above, it was obvious for the transmitter to check for an available buffer, and to wait for a predetermined time if unavailable, so that the necessary transmit processes may be performed on the buffers current contents. When the processes are completed and the buffer is made available (*after a predetermined time*), the buffer will be made available to new data to be transmitted on the VC since the transmitter are operable to transmit data more than once. Therefore, it would have been obvious to repeat the step of checking the buffer so that when it has been detected as available, new data

may enter it for transmission. Once of ordinary skill in the art would have have been motivated to do this, so that data can enter the transmit buffer at the same rate that data is transmitted from it, making the transmit process more efficient and preventing congestion.

5. Claims 4 and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Num et al. (US#5,633,867) in view of Sugawara (US#5,852,602) as applied to the claims above, and further in view of Bennett (US#5,610,745) .

With respect to claim 9, Ben-Num et al. and Sugawara disclose the claimed limitations with the rejection of claim 7 as discussed in paragraphs 4 above. Ben-Num further teaches of a “null cell” where the received data does not contain a credit (Col. 5, lines 59-62). According to the system disclosed by Ben-Num, when the transmitter has no credit on the VC (Col. 2, lines 31-32). Sugawara teaches a credit control method for an ATM communication apparatus for performing data transfer of a fixed-length packet from a packet sending-side to a packet receiving-side by flow control using credit information, comprising the steps of sending an initial credit value from the packet receiving-side to the packet sending-side prior to transferring a packet, starting transfer of a packet on the packet sending-side when the initial credit value is received. However, Ben-Num et al. and Sugawara do not disclose expressly wherein the transmitter checking for available data for transmission if the virtual channel credit packet is found. In the same field of endeavor, Bennett teaches of a similar system employing credit-based flow control using credit counter for tracking the availability of the receive buffer. Fig. 5 shows a flow chart illustrated of the smart credit method for tracking buffer availability

includes checking for available data for transmission if the virtual channel credit packet is found (Col. 7, lines 23-33).

Regarding claim 10, Bennett further teaches of the transmitter includes repeating the step of looking for the virtual channel credit packet until the packet is found (See Fig. 5; Col. 5, lines 23-33). Where frames to transmit is yes, the credit counter is zero and no receiver ready signal has been received. It will repeat steps 510-515-530-510 until a receiver ready signal is received.

Regarding claims 11-12, Bennett further teaches of the transmitter waiting for a predetermined time if no data is available (See Fig. 5; Col. 7, lines 23-33) where the predetermined time is the time in which the data becomes available (*when the answer to 510 becomes yes*). Bennett further teaches of the transmitter repeating this process until data becomes available (*answer to 510 becomes yes*), and then sending data if it is available (See Fig. 5; and the steps 510-515-520).

Regarding claims 4 and 13, though Ben-Num et al. and Sugawara fail to explicitly teach of repeating the method according to the claim 1 for the next virtual channel credit number until all virtual channels are running. Ben-Num teaches of the system operating “x” VC’s simultaneously (Col. 2, lines 41-44). In order to establish multiple VC’s simultaneously, one of ordinary skill in the art would have repeated the method of claim 1 until all available VC were operating. One of ordinary skill in the art would have been motivated to do this, so that multiple connections can be established without permanency, thereby increasing throughput and flexibility of handling bandwidth.

Regarding claims 14-15, though Ben-Num does not explicitly show the receiver checking if the data has been received from the transmitter and waiting for a

predetermined time if data has not been received. In order to receive data over the virtual channels, the receiver must check if it has received any. Furthermore, if it has not received the data, it must wait for a predetermined time. That time being the time until the data does arrive. Therefore, it's inherent in the design. Ben-Num further fails to explicitly teach of repeating the method according to claim 1 for the next virtual channel credit number. However, Ben-Num teaches of the system operating "x" VC's simultaneously (Col. 2, lines 41-44). In order to establish multiple VC's simultaneously, one of ordinary skill in the art would have repeated the method of claim 1 until all available VC were operating. One of ordinary skill in the art would have been motivated to do this, so that multiple connections can be established without permanency, thereby increasing throughput and flexibility of handling bandwidth.

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Monin (US#6,243,358) is cited to show the process and device for allocating resources in a packet transmission digital network.

The Zheng et al. (US#5,432,824) is cited to show the credit/rate-based system for controlling traffic in a digital communication network.

The Hunt et al. (US#5,898,671) is cited to show the transmitter controlled flow control for buffer allocation in wide area ATM networks.

The Peck et al. (US#6,452,903) is cited to show the network switch supporting rate-based credit-based flow control mechanisms on a link by link basis.

The Ben-Michael et al. (US#6,002,675) is cited to show the method and apparatus for controlling transmission of data over a network.

The Bader et al. (US#5,901,138) is cited to show the process for improving the efficiency of high performance routing.

The Gregg et al. (US#6,681,254) is cited to show the method of controlling the flow of information between senders and receivers across links being used as channels.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (703)305-1029. The examiner can normally be reached on Mon - Fri from 6:30 to 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3988.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

7. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

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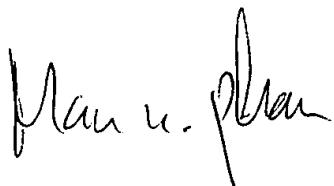
or faxed to: (703) 305-9051, (for formal communications intended for entry)

Or: (703) 305-3988 (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal
Drive, Arlington, VA., Sixth Floor (Receptionist).

Mphan

03/7/2004


MAN PHAN
PATENT EXAMINER